

SAXS

The beamlines - current resources

Most common beamline elements in use

Optics

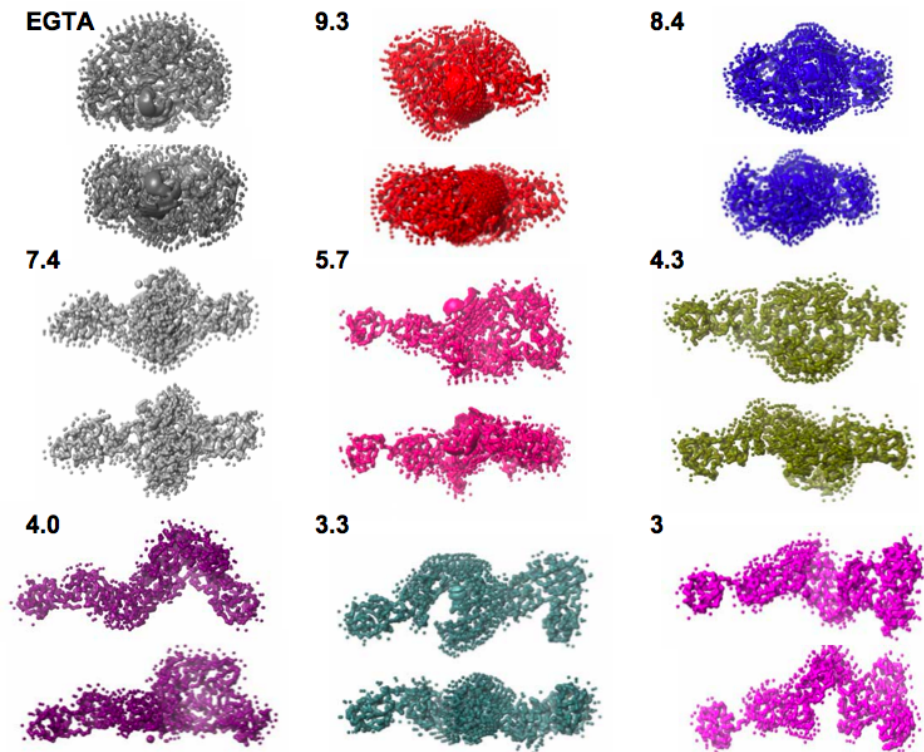
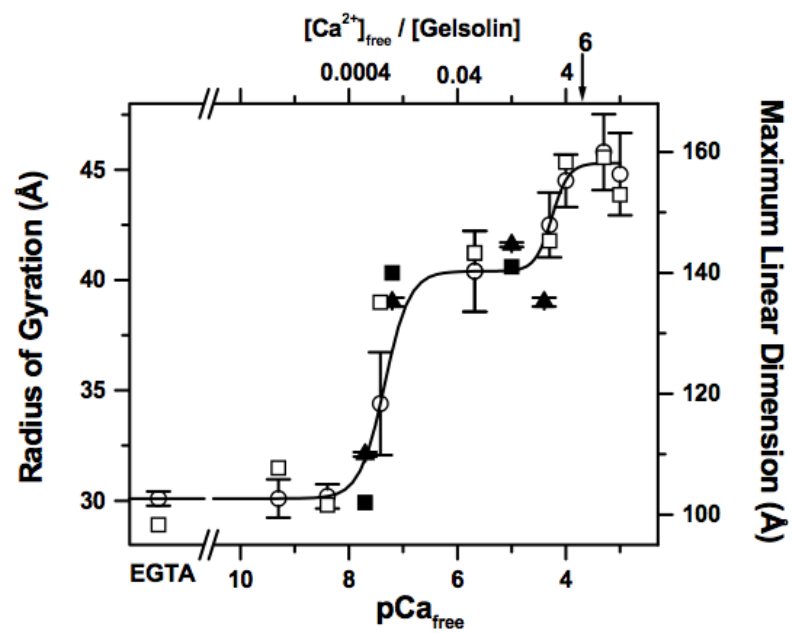
mono, focusing mirror, slits, evacuate beam path

End-station

CCD, sample cell, syringe pump

Research Program

Low resolution structural modeling of proteins in solution.



Conformation change of Gelsolin as a function of free Ca concentration

Ashish et.al., J. Biol. Chem., 2007

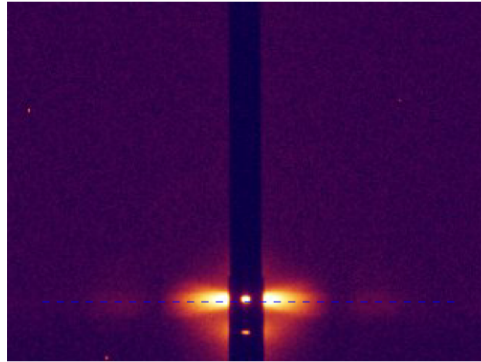
What can be done with a new source such as NSLSII

Unsolved Science Questions

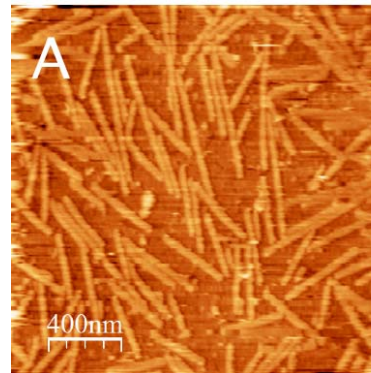
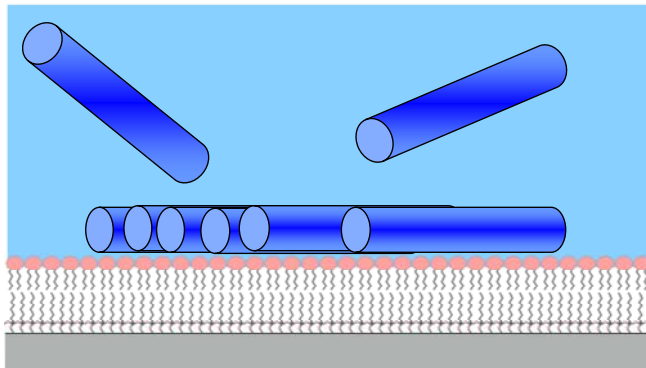
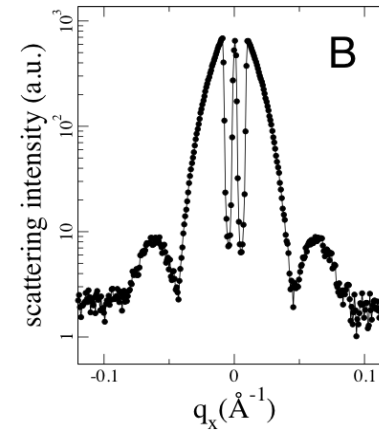
(Low resolution) molecular movies of protein-protein interaction.
Membrane proteins.

Source may not be the limiting factor.

A



B



Tobacco Mosaic Virus (TMV) adsorbed to a substrate submerged
in a buffer solution

Yang, Wang, Fukuto, Cheeco on-going

My next SAXS beamlines

Beamlines

- ID beamline more challenging experiments that require high brightness

- BM beamline for protein solution scattering that will have high demand for capacity

Optics

- Not fundamentally different from NSLS beamlines

End-station

- Better detectors: 2D pixel array detector, SAXS/WAXS

- Multiple probes for sample characterization (UV-VIS, CD, DLS, ...)

- Microfluidic sample cell that can perform solution processing

- Automatic sample handling

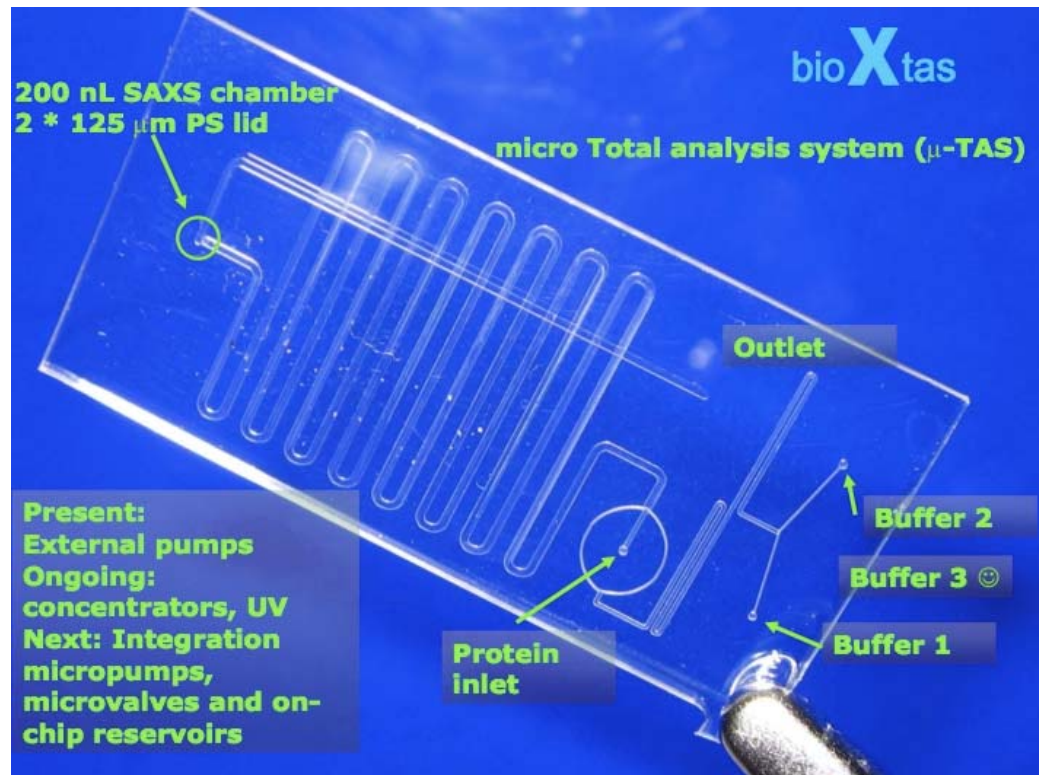
Laboratories and ancillary facilities

Labs

- Wet lab, protein purification facility

IT

- Remote access



200nl sample volume, 0.5mm beam, 10^9 ph/s, 5min exposure

On-going effort in Europe
from Vestergaard presentation, University of Copenhagen

How to we get ready for NSLS-II?

Instrumentation (detectors, microfluidics, ...)

Capability to support user research (staffing, supporting facilities, ...)

Methods for data analysis

Grow user community